

NOTES 01: DATA

Stat 120 | Fall 2025

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1 The Structure of Data

Cases

Variables

2 Types of Variables

Quantitative

Categorical

Explanatory

Response

3 Examples

Label the cases and variables. For each variable, state whether it is categorical or quantitative. Indicate if there's clear response or explanatory variables

3.1 Penguins

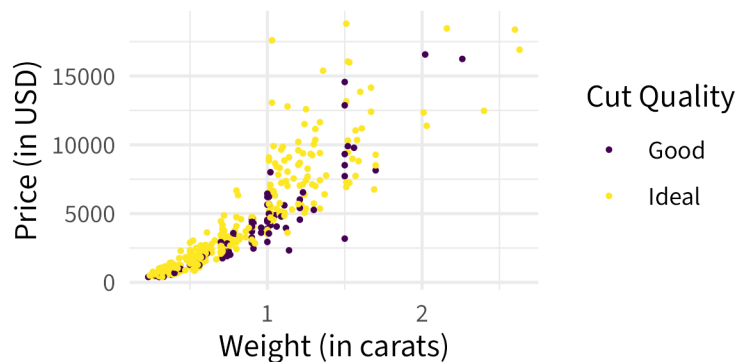
A tibble: 344 x 8

	species	island	bill_length_mm	bill_depth_mm	flipper_length_mm	body_mass_g
	<fct>	<fct>	<dbl>	<dbl>	<int>	<int>
1	Adelie	Torgersen	39.1	18.7	181	3750
2	Adelie	Torgersen	39.5	17.4	186	3800
3	Adelie	Torgersen	40.3	18	195	3250
4	Adelie	Torgersen	NA	NA	NA	NA
5	Adelie	Torgersen	36.7	19.3	193	3450
6	Adelie	Torgersen	39.3	20.6	190	3650
7	Adelie	Torgersen	38.9	17.8	181	3625
8	Adelie	Torgersen	39.2	19.6	195	4675
9	Adelie	Torgersen	34.1	18.1	193	3475
10	Adelie	Torgersen	42	20.2	190	4250

i 334 more rows

i 2 more variables: sex <fct>, year <int>

3.2 Price of diamonds by carat and cut quality



3.3 Is there a "Sprinting Gene"?

A gene called ACTN3 encodes a protein which functions in fast-twitch muscles. Some people have a variant of this gene that cannot yield this protein. To address the question of whether this gene is associated with sprinting ability, geneticists tested people from three different groups: world-class sprinters, world-class marathon runners, and a control group of non-athletes. In the same tested, 6% of the sprinters had the gene variant, compared with 18% of non-athletes and 24% of the marathon runners.

Sketch out a possible dataset, and then answer the questions.